Glossary

- Introduction to Volunteer Water Quality Monitoring Training Notebook -

Acid precipitation:	All forms of precipitation that have acidity lower than normal rainfall.
Acid mine drainage:	Water that has become acidic by flowing over or through coal strip mine wastes. Can affect either surface water or groundwater.
Acute toxicity:	Any poisonous effect produced by a single short-term exposure which results in severe biological harm or death.
Advocacy:	The act of pleading for, supporting or recommending a cause or course or action.
Aerobic:	Life or processes that depend on the presence of oxygen.
Aesthetic quality:	Characteristics that are pleasing to the eye, such as the beauty of a natural stream or watershed.
Algae:	Primitive aquatic plants capable of photosynthesis. These simple plants lack "true" stems, leaves, or roots. Algae occur in three forms: planktonic (tiny plant cells that float in the water column and contribute to water color; called phytoplankton), filamentous (fine threads; form mats) and macrophytic (resemble rooted aquatic plants).
Alkalinity:	A measurement of water's ability to neutralize acid.
Anaerobic:	Life or processes that can occur without oxygen.
Aquatic community:	All the groups of plants and animals occupying a common water body.
Aquatic habitat:	All of the areas in a stream, lake or wetland that are occupied by an organism, population, or community.
Aquifer:	An underground bed or layer of earth, gravel or porous stone that contains water.
Biochemical Oxygen Demand (BOD):	A measure of the amount of oxygen required by microorganisms to breakdown organic matter in water. The greater the organic pollution, the greater the BOD. A measure of the level of organic pollution.
Bacteria:	Single-celled microorganisms that lack chlorophyll.

Bed Load: Consists of particles that mainly stay in contact with the streambed and may be moved by the stream water's energy. Includes all particles that do not remain in suspension in the water column.

Beneficial use: The uses of a water body that are protected by state laws called water quality standards. The uses must be designated in the water quality standards. Some of the uses are live stock watering, irrigation, protection of aquatic life, fishing, boating, swimming and water supply. In Missouri DNR rules, also called "designated uses."

Benthic region: The bottom of a body of water.

Best Management Practices (BMPs): **C**onsist of structural, vegetative, or management methods that are performed or installed to prevent nonpoint source water pollution.

Bioaccumulation: The process whereby a toxic substance becomes concentrated within organisms.

Biodegradable: Any substance that decomposes quickly through the action of microorganisms.

Biological control: Using natural means, not chemicals, to control pests. Examples are predatory organisms, sterilization or inhibiting hormones.

Biological magnification: The accumulation of toxics which increases substances stepwise through the food chain. The mechanism by which pesticides and heavy metals can be concentrated in fish.

Biological monitoring: Use of living organisms to assess or test water quality. Also called "biomonitoring."

Bloom: A nuisance growth of algae and/or higher aquatic plants in a body of water, often caused by excessive nutrients.

Blue-green algae: A group of algae that often, but not always, appears green in color. Often associated with excessive nutrients in a water body.

Buffer strip: Strips of grass or other erosion-resisting vegetation between disturbed soils and a stream, lake, or wetland. Their purpose is to slow runoff water and trap silt and other pollutants before they reach waterways. A type of Best Management Practice (BMP).

Carbon dioxide (CO_2): A colorless, odorless, nonpoisonous gas normally part of ambient air. A result of fossil fuel combustion, aerobic respiration and decomposition.

Carcinogen: A cancer-causing agent.

Carnivore: Flesh-eating organism.

Channel: See "Stream channel."

Channel paving: The lining of a stream channel with concrete, asphalt or other material.

Channelization: The process of changing and straightening the natural path of a waterway.

Chlorinated hydrocarbons: A class of persistent, broad-spectrum chemicals, such as pesticides that linger in the environment and accumulate in the food chain.

Classified streams: Are those that maintain water during low flow periods in dry weather and have official, identifiable beneficial uses.

Clear cut: A forest management technique that involves harvesting all the trees in one area at one time. Under certain soil and slope conditions it can result in sedimentation of nearby streams.

Chemical Oxygen Demand (COD): A measure of the oxygen required to oxidize all compounds in water, organic and inorganic. A measure of the level of pollution.

Combined sewers: A system that carries both sewage and storm water runoff. In dry weather, sewage goes to the wastewater treatment plant. During a rain event, storm water also goes to the treatment plant and there may be more flow than the plant can process. When that occurs, the overflow (a mixture of sewage and storm water) will then go straight to the receiving stream untreated. Combined sewer overflow is often abbreviated, "CSO."

Conservation: The controlled use and systematic protection of natural resources.

Contour interval: The designated difference in elevation between two consecutive contour lines.

Contour line: A line on a map that passes through points of the same elevation.

Contour plowing: Farming methods that break ground following the contour of the land in a way that reduces erosion.

Cubic Feet per Second (CFS): A volume of water equal to one cubic foot of water passing a given point in one second. A cubic foot is approximately the size of a regulation basketball.

Decomposition: The breakdown of organic matter by bacteria and fungi.

Depositional zone: An area of a stream in which current is relatively slow and particles fall out of suspension and are deposited on the stream bottom.

Designated uses: Your state water quality agency is required to "designate" the uses for each waterbody. Important uses are swimming, drinking water, and aquatic life. The 1972 Clean Water Act set an objective that all the nation's waters should be "fishable and

swimable." (Note: "fishable" is shorthand for protecting all aquatic life, not just fish for human consumption.)

Detritus: Partially decomposed organic matter (plant or animal).

Diatoms: One of the types of planktonic algae. Composed of silica walls and often have bizarre, pointy shapes.

Diversity: The number of different types of organisms in a community or an ecosystem.

Divide: The topographic boundaries of a watershed.

Dissolved Oxygen (DO): A measurement of the oxygen dissolved in water necessary for the life of fish and other aquatic organisms.

Down-cutting: Vertical erosion of a stream bottom.

Drainage network: The system of streams that transports water, sediment, and other materials within a watershed.

Dredging: The removal of material from the bottom of water bodies.

Dump: A site where people illegally dispose of solid wastes like trash.

E. coli: The abbreviated name of a bacterium named *Escherichia* (Genus) *coli* (species) that normally live in the intestines of warm-blooded animals. Some strains of this bacterium can cause serious illness.

Ecological integrity: A measure of the health of the entire area or community based on how much of the original physical, biological and chemical components of the area remain intact.

Ecological stress: Any condition that can alter the food chain or quality of the environment.

Ecology: The science studying the relationship of living things to one another and to their environments.

Ecosystem: The interacting system of all living things within an area with each other and with the nonliving portion of the environment.

Effluent: An outflow, like a stream from a lake, or a discharge of treated or untreated liquid waste (e.g., municipal or industrial wastewater).

Embeddedness: Embeddedness refers to how much of a rock is embedded in the sand or silt of a streambed, which in turn, is an indication of soil erosion.

Emergent plants: Plants rooted in the bottom of a stream, lake, or wetland that rise above the water surface.

Enrichment: Point source discharges and/or nonpoint source runoff that adds nutrients (nitrogen, phosphorus, carbon compounds) to a water body, greatly increasing the growth potential for algae and aquatic plants.

Ephemeral stream: Ephemeral streams exist above the water table and so do not have a flow dependent upon the water table. These streams lose water into the channel bed in a downstream direction.

Erosion: The removal or wearing away of soil or rock by water, wind or other forces or processes.

Eutrophic: Waters rich in minerals and organic nutrients that promote a proliferation of plant life, especially algae.

Eutrophication: Natural eutrophication is the process of aging of a lake, becoming highly productive and evolving into a marsh. Cultural eutrophication occurs when nutrients are added from point and nonpoint source pollution.

Fecal coliform bacteria: The portion of the coliform group of bacteria present in the gut or feces of warm-blooded animals. The presence of fecal coliform bacteria in water is an indication of pollution and potential human health problems. Government agencies have shifted to using *E. coli* as the indicator of choice, rather than fecal coliform bacteria.

Filamentous algae: Small plants, recognizable as attached, hairlike growths, often appearing as waving strands in the water. A large amount of filamentous algae is an indication of excessive nutrients. For purposes of the Visual Survey, it is defined as algal strands more than 2 inches in length.

Filter feeder: Organisms that filter or strain food from the water, including types of insects, mussels, and fish.

Floodplain: A floodplain is the flattened portion of the stream valley susceptible to large floods.

Floodplain scouring: Erosion of a floodplain by floodwaters.

Flow: The amount of water moving in a stream in a given amount of time, often measured in cubic feet per second (cfs). Also referred to as "stream discharge."

Food chain: The transfer of food energy from the primary source, plants, through a series of organisms repeatedly eating and being eaten. For example, algae to aquatic insects to small fish to larger fish to fish-eating birds to mammals. Food chains intertwine to become food webs.

Gradient: The slope of the stream channel measured in vertical drop over a horizontal distance (e.g., feet per mile). This is the source of energy

	for flowing water. The steeper the gradient, the greater the water current's force/energy.
Gravel dredging:	The mining (removal) of gravel from a stream or floodplain with the use of heavy equipment.
Grazing insects:	Insects that feed on plant material growing on the substrate.
Groundwater:	Water beneath the earth's surface, often between saturated soil and rock, that supplies wells and springs.
Groundwater recharge:	The process whereby water seeps into the ground to replenish the groundwater supply.
Habitat:	The sum of environmental conditions in a specific place that is occupied by an organism, population or community.
Hazardous waste:	Waste materials that are inherently dangerous to handle or dispose of, including old explosives, radioactive materials, some chemicals and some biological wastes.
Headwater:	The place where a waterway begins.
Heavy metals:	Metallic elements, like mercury, chromium, cadmium, arsenic and lead, with high molecular weights. These can harm organisms at low concentrations and bio-accumulate in the food chain.
Herbicide:	A chemical used to destroy and/or control plant growth.
Herbivore:	A plant-eating organism.
Hydrogen sulfide:	The gas emitted during anaerobic organic decomposition that smells like rotten eggs. Also a byproduct of oil refining and burning, it can cause illness in heavy concentrations and is toxic to fish and other aquatic organisms.
Impervious surfaces:	Surfaces that are non-porous and that water cannot penetrate. Examples of impervious surfaces are roofs and paved surfaces, like streets, parking lots and sidewalks and impacted soils.
Impoundment:	A body of water confined by a dike, floodgate, dam, or other barrier (also see "Reservoir").
Indicator:	Anything that, by its presence or absence, may be used to reveal an environmental condition.
Infiltration:	The action of water moving through small openings in the earth as it seeps down into the groundwater.
Inorganic:	Any compound not containing carbon.

Intermittent stream: Intermittent streams that receive groundwater flow only part of the year, stopping when the water table drops below the channel.

Intolerant species: Species that are sensitive to and affected by pollution.

Invertebrate: Animal without a backbone.

Larva: The active, immature form of an animal that undergoes complete metamorphosis. Larvae are incapable of reproduction, lack wings and are totally different from the adult.

Latitude: Imaginary lines used to locate positions on the earth. The angular distance in degrees, minutes, seconds measured from the center of the earth to a point north and south of the Equator, running parallel to the Equator.

Leachate: The material that occurs as a result of leaching and can cause serious pollution problems. For example, rainwater that percolates through a sanitary landfill and picks up contaminants is called a leachate from the landfill.

Leaching: The process by which nutrients, chemicals or contaminants are dissolved and carried away by water or moved into a lower layer of soil.

Lead: A heavy metal that may be hazardous to health if breathed or swallowed. The symbol for lead is Pb. Historically,lead has been extensively mined from several areas in southern Missouri. Lead released through mining-related activities affects water quality and causes health problems in these areas.

Longitude: Imaginary lines used to locate positions on the earth. The angular distance in degrees, minutes, seconds measured from the center of the earth to a point east and west of the Greenwich England, the Prime Meridian.

Macroinvertebrate: Animals that do not have backbones (invertebrates) but are visible to the naked eye (macro).

Meanders: The bends in a winding stream or river.

Metamorphose: To change into a different form, such as from an insect egg to a nymph, or a pupa to an adult.

Microhabitat: A very small, specialized habitat that immediately surrounds an organism (also see “Habitat”).

Mollusk: Soft-bodied (usually hard-shelled) animals such as clams and snails.

Monitoring: To collect and record the status (in our case, of water quality) on a regular basis.

Mouth:	The place where a waterway flows into another stream, river, lake or ocean.
Nonpoint source pollution (NPS):	A type of pollution coming from diffuse sources such as runoff from agricultural lands, construction sites, streets and parking lots.
Nutrient:	Substances necessary for the growth of all living things. Examples include nitrogen, phosphorus, carbon, ammonia.
Nymph:	The active, immature form of an animal that undergoes incomplete metamorphosis. In general, nymphs resemble their adult counterparts much more than the larval forms of insects that undergo complete metamorphosis.
Order:	A taxonomic grouping of biological families of organisms with similar characteristics.
Organic:	Referring to or derived from living organisms. In chemistry, any compound containing carbon.
Organophosphate:	A class of organic chemicals containing phosphorus, several of which are used as pesticides.
Outfall:	In most cases, outfalls are easily-defined locations (most often a pipe or channel) at which water leaves a specific facility or area on its way to eventually entering a stream or lake (also see "Point source pollution").
Pathogen:	An agent that causes disease, especially a living microorganism such as a bacterium or fungus.
Pathogenic:	Capable of causing disease.
Perennial stream:	Perennial streams fed continuously by a shallow water table.
Periphyton:	Algae and associated microorganisms growing attached to any submerged surface.
Pesticide:	A chemical that kills insects, plants or rodents. Examples include herbicides (used to kill plants) and insecticides (used to kill insects).
pH:	A measure that indicates the relative acidity or alkalinity of a substance. The logarithmic pH scale ranges from 0 (most acid) to 14 (most basic), with a pH of 7 being neutral.
Phosphorus:	An essential plant nutrient that, in excessive quantities, can contribute to the eutrophication of water bodies.
Photosynthesis:	The manufacturing of carbohydrates and oxygen by plants from

carbon dioxide and water in the presence of chlorophyll, using sunlight as an energy source.

Plankton: Microscopic plants (phytoplankton) and animals (zooplankton) that are suspended in the water column (also see "Algae").

Point source pollution: Pollution that comes from a specific source, or outfall, such as a discharge pipe or culvert.

Pollution: The presence of any substance that harms the environment.

Pool: That portion of a stream that is relatively deep and slow moving.

Precipitate: A solid that separates from a solution because of some chemical or physical change.

Predator: An organism that lives by capturing and feeding upon other animals (the prey).

Pre-treatment: Processes used to reduce the amount of pollution in water before it enters a treatment plant.

Prey: An animal hunted and killed by another animal (the predator).

Primacy: A state government may assume the responsibility for the enforcement of environmental laws under an agreement with the U.S. Environmental Protection Agency or other federal agency (depending on the particular law). By doing so, the state exerts "primacy." Missouri has primacy for most federal environmental laws.

Primary producers: The first (lowest) level in the food chain composed of photosynthetic, green plants.

Primary treatment: The first stage of wastewater treatment. The removal of floating debris and solids by screening and sedimentation.

Pupa: The non-feeding stage during which an insect is enclosed in a protective case while changing (metmorphosing) from larva to an adult.

Raw sewage: Wastewater that has not been treated.

Receiving waters: Any body of water into which treated or untreated wastes are discharged.

Relief: The variation in the elevation of the earth's surface.

Reservoir: Any holding area, natural or artificial, used to store, regulate, or control water (also see "Impoundment").

Riffle: The portion of a stream characterized by a steep descent in the streambed and where the water breaks over rocks and/or boulders.

Riparian: Area adjacent to a river or stream.

Riparian corridor: The linear strip of land running adjacent to a stream. There is variation in the definition of riparian corridor, particularly relating to width. For Stream Team purposes, particularly when doing a Visual Survey, it is measured 100 feet away from the top of streambank.

Runoff: Water from rain, snowmelt or irrigation that flows over the ground and enters a stream, lake or wetland. Can collect pollutants from air or land and carry them to the receiving waters.

Sanitary landfill: An engineered facility for disposal of solid wastes that does not endanger public health or cause environmental damage.

Scale: The ratio of the distance on a map to the actual distance on Earth's surface.

Scavenger: An animal that eats refuse and decaying organic matter.

Secondary treatment: Biological treatment of wastewater after the primary treatment, using bacteria to consume the organic wastes.

Sediment: Soil, sand and minerals washed from land into waterways.

Sedimentation: The process by which soil particles (sediment) enter, accumulate and settle to the bottom of a waterway.

Seepage: Water that flows through the soil.

Septic odor: The smell of rotten eggs produced by the decomposition of organic matter in the absence of oxygen.

Settling ponds: Ponds designed to catch runoff and slow the flow enough to cause the sediment to settle out of water.

Sewage: The organic waste and wastewater produced by residential and commercial establishments.

Sewer: A conduit that carries wastewater and/or storm water runoff from the source to a treatment plant or receiving stream.

Silt: Fine particles of soil or rock that can be picked up by air or water and deposited as sediment.

Siltation: The process of silt settling out of the water and being deposited as sediment on the bottom of a water body.

Slumping: The downward slipping of a mass of streambank material usually caused by streambank caving.

Solubility: The capacity to be dissolved or liquefied.

Species: A unit of classification for a group of closely related individuals.

Specific conductance: A measurement of the water's ability to conduct electricity. Used to measure pollution, especially salts, in water.

Stakeholders: Anyone who lives in the watershed or who has land management responsibilities in it. Stakeholders include (among others) government agencies, businesses, private individuals and special interest groups. Could be anyone whose quality of life is affected.

Storm sewer: A system that collects and carries rain and snow runoff to a point where it could ideally soak back into the groundwater. Most flows into surface waters.

Storm water runoff: Occurs when precipitation from rain or snowmelt flows over the ground. Impervious surfaces like driveways, sidewalks, parking lots and streets prevent storm water from naturally soaking into the ground.

Streambank: The area of land that rises from the streambed and reaches a crest. The crest is also the beginning of the riparian zone. Such crests are most noticeable when looking at the outside bend of a stream meander. If, and only if, there is no marked change in elevation or obvious crest, consider the bank to extend no further than 50 feet away from the edge of the streambed when doing a Visual Survey.

Streambank caving: The partial or complete collapse of a streambank. Frequently caused by soil saturation by floodwaters followed by a rapid drop in water level.

Streambed: The area where a natural stream of water runs, or may run, depending on precipitation. This is the area between the streambanks in which substrate is deposited or removed by the energy of moving water. The streambed may be dry during dry times of the year, especially in the upper stream reaches.

Stream channel: An area that contains continuously or periodically flowing water that is confined by banks and a streambed. The long, narrow depression shaped by the concentrated flow water in a stream.

Stream depth: A measurement of the depth of a stream from the water's surface to the streambed.

Stream discharge: See “Flow.”

Stream flow: See "Flow."

Strip cropping: Strips of grass or other close growing vegetation are left unplowed between bands of cropped land. Surface runoff is intercepted by the strips, slowed, and its sediment deposited. A type of Best Management Practice (BMP).

Substrate: Materials that make up the bottom of a body of water such as silt, sand, gravel, cobble, boulders or bedrock. Also, the surface upon which an organism lives or is attached (also see Streambed).

Sub-watershed: The watersheds of tributaries to a main waterway. For example, the Missouri River is a sub-watershed of the Mississippi River watershed, and the Gasconade River is a sub-watershed of the Missouri.

Terracing: Wide, parallel ridges that are constructed on sloping farmland perpendicular to the slope. This slows runoff water and reduces erosion. A type of Best Management Practice (BMP).

Terrestrial: Living on land rather than in water.

Tertiary treatment: Advanced treatment of wastewater that goes beyond the secondary or biological stage. Removes nutrients such as phosphorus and nitrogen and most suspended solids.

Thermal pollution: Discharge of heated water that can affect the life processes of aquatic plants and animals.

Tolerance: The ability of an organism to cope with changes in its environment.

Topography: The shape and/or physical features of the land's surface, both natural and artificial (e.g., hills, rivers, cities, roads).

Toxicity: A measurement of how poisonous or harmful a substance is to plants and animals.

Toxin: A substance that is harmful to humans and other organisms.

Tributary: A stream that connects with and contributes water to another stream.

Turbidity: A measurement of the clarity of water. Suspended matter (such as soil particles) and plankton (such as algae) most often cause cloudy water.

Unclassified streams do not have water in them during low flows in dry weather and do not have identified beneficial uses. In simple terms, streams that dry up completely during dry periods of the year are considered unclassified.

Undercutting: A type of erosion that occurs when the base of a stream bank is washed away. Usually occurs during high flows and is most evident at outside bends in the stream and results in an unstable, overhanging bank.

Urban runoff: Storm water from city streets, parking lots, parks, housing developments and industrial complexes. Can carry a variety of pollutants including fertilizer, pesticides, pet waste, petroleum products, litter, organic wastes and heated water (thermal pollution).

Wastewater: Water carrying waste from homes, farms, businesses and industries.

Water cycle: The continuous circulation of water in systems throughout the planet involving condensation, precipitation, runoff, evaporation and transpiration.

Water quality: The condition of the water with regard to the presence or absence of pollution.

Water quality standard: A management tool that 1) considers what water will be used for, 2) sets levels to protect those uses, 3) implements and enforces water treatment levels for discharges and 4) protects existing high quality waters.

Watershed: All the land that serves as a drainage area for a specific stream, river, lake or wetland. The boundaries of a watershed are defined by topography.

Water table: The upper level of groundwater.

Wetland: An area covered with shallow water or with saturated soil at least part of the year.

Zooplankton: Small, often microscopic, aquatic animals suspended in the water column (also see "Plankton").